DOCUMENT RESUME

ED 072 154 UD 013 236

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TITLE	Use of Visual Literacy Techniques to Teach Units on Career Development to Disadvantaged Seventh Graders. Final Report.
INSTITUTION	Pennsylvania State Dept. of Education, Harrisburg. Bureau of Educational Research.
SPONS AGENCY	National Center for Educational Research and Development (DHEW/OE), Washington, D.C. Regional Research Program.
BUREAU NO	BR-2-C-023
PUB DATE	Nov 72
GRANT	OEG-3-72-0034
NOTE	84p.
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	Career Education; Curriculum Development; *Disadvantaged Youth; Educationally Disadvantaged; Field Trips; *Grade 7; Industrial Arts; *Industrial Education; Instructional Media; Middle Schools; Program Evaluation; Teaching Methods; *Visual Literacy; *Vocational Development; Work Attitudes; Work Experience
IDENTIFIERS	Pennsylvania

ABSTRACT

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FINAL REPORT

Project No. 2-C-023
Grant No. OEG-3-72-0034

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USE OF VISUAL LITERACY TECHNIQUES TO TEACH UNITS ON CAREER DEVELOPMENT TO DISADVANTAGED SEVENTH GRADERS

November 1972

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UD 013236

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

Office of Education

National Center for Educational Research and Development
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The research reported herein was performed pursuant to a grant with the Office of Education, U.S. Department of Health, Education, and Welfare. Contractors undertaking such projects under Government sponsorship are encouraged to express freely their professional judgment in the conduct of the project. Points of view or opinions stated do not, therefore, necessarily represent official Office of Education position or policy.

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The VLT program also included GWWCG. Since significant differences did not occur between the VLT and GWWCG groups, this study did not support the additional expense of visual literacy techniques which required the purchase of cameras.

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ACKNOWLEDGEMENTS

Grateful appreciation is extended to the administrators of the Harrisburg School District, especially Mr. Jack Taylor, Assistant Principal of the Harrisburg Middle School. Particular appreciation is due to the following teaching personnel at the Harrisburg Middle School:

Mr. John Benasutti
Mr. Kenneth Hickerson
Mr. Thomas Johnson
Mr. Robert Liddell

The generous cooperation of the following consultants is warmly acknowledged:

Dr. Carroll Curtis, Pennsylvania Department of Education
Dr. Stephen Franchak, Pennsylvania Department of Education
Mr. Elmer Hensler, Pennsylvania Department of Education
Dr. Edwin Herr, The Pennsylvania State University
Dr. Grace Laverty, Pennsylvania Department of Education
Dr. John Shemick, The Pennsylvania State University
Mr. Earl Zimmerman, Pennsylvania Department of Education

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CHAPTER I

INTRODUCTION

Background

Schmitt's (1966) national survey of industrial arts education identified 21 teacher problems. Providing career guidance information was the sixth most difficult problem selected by the industrial arts teachers in the survey. Lewis' (1970) survey of vocational guidance in industrial arts revealed that industrial arts teachers react favorably to presenting vocational guidance information in the classroom.

The findings of these surveys indicated that industrial arts teachers have an interest in vocational guidance but are having problems teaching occupational information in the classroom. As a result of these findings, the writers became interested in seeking ways to effectively help industrial arts teachers provide career development information in the classroom. More specifically, they wish to find better ways of teaching career development information to the disadvantaged pupil.

Several questions were raised by this concern. What accounts for the relatively low verbal performance and consistent pattern of academic retardation of the disadvantaged pupil? How can the disadvantaged pupil learn in a school setting, considering all of his academic inadequacies and language deficiencies? How can attitudes, interests and occupational knowledge be improved?

This study was an attempt to explore these questions by introducing a mode of instruction called "visual literacy" combined with an occupational curriculum emphasis. Neither visual literacy nor a curriculum on occupational information is new; however, the combination of the two presents a new approach to the development of an awareness of the world of work. Visual literacy involves (1) visual sequencing, (2) classifying and linking visual and verbal phenomena and (3) a self-directed photographic endeavor. The combination of these three visual literacy techniques, combined with a meaningful curriculum, was an attempt to improve the teaching of occupational information to the educationally disadvantaged pupil.

Most of the research on visual literacy is presently centered around the development of reading skills. Recently, research by the Kodak Laboratories (Debes, 1969; Fransecky, 1969; Whitmore, 1971) has produced a variety of useful concepts such as the branching tree concept, visual sequencing, visual language and a hierarchy of visual skills. Each one of these conceptual attributes is seen as interdependent and is related to reading skills. Bernstein (1961), Eisenberg (1963) and Goldberg (1967) agree that visual literacy techniques are important in improving reading skills.

It can easily be seen how visual sequencing, for example, can be used as a teaching technique for problem readers. As pointed out by Bernstein (1961) and Deutsch (1967), the lack of rich stimuli and a systematic ordering of stimulation sequences contributes to the low reading levels of the disadvantaged pupil. Photo-sequencing uses the individual photograph as one global component in a semantic flow of visual ideas rather than as a locus of numerous specific details. The primary benefit from dealing with the global unit in a photographic sequence is that a child learns to record and interpret the "Gestalt," or total configuration, of a photographic unit. In order for these photographic sequences to have more meaning, they should be used by the child himself. If the pupil is given the opportunity to make the photographic sequences himself, he may have other sensory experiences in his interaction with people, objects, animals and other elements in his visual environment that give extra meaning and emotional value to the visual ideas that he manipulates.

It seems, then, that the visual literacy mode of instruction is capable of motivating pupils and of providing for them a useful tool of communication. A curriculum that is appropriate to this technique and suitable for use with the disadvantaged pupil, however, also is needed. One of the purposes of the study was to improve and to evaluate such a curriculum.

According to Johnson (1964), the following three fundamental recommendations must be taken into account in developing a realistic curriculum for the disadvantaged pupil: (1) The characteristics of the individuals for whom the program is being planned must be determined, (2) A guess or prognosis concerning the future of these individuals must be made and (3) The program must reflect and be in harmony with the environmental background they bring with them to the school.

In light of Johnson's recommendations, the characteristics of the disadvantaged pupil were considered in using the visual literacy approach. Reading difficulties were moderated by visual sequencing techniques. Furthermore, the lack of middle class values was compensated for by the use of role playing and a job ladder concept. This was an effort to change the low aspiration levels of these pupils. Johnson's second point concerning the projection into the future for these pupils was met by using photographic stories of what the pupil would like to do in life or what job he is interested in doing. These photographic stories were shown to his peers for their consideration as well as subjected to self-evaluation. As pointed out earlier, pictures taken by the pupil have more meaning than a professionally produced picture. Johnson's last point, with regard to bringing the environment into the program, was met by experimental take-home assignments and by field trips to local industries and other employment settings.

In summary, industrial arts education is in a position to offer a rich program in the area of career development. The problem of

teaching this information to disadvantaged pupils may be met through the wide variety of physical and problem-solving activities that are common to industrial arts. The visual literacy technique was planned as a new dimension capable of "turning on" pupils and providing for them a useful communication tool that would enhance their general cognitive and verbal literacy as well as their level of occupational aspiration.

Purpose and Objectives

The major purpose of this study was to investigate the effects of three types of instructional treatments on knowledge, attitudes and interest towards the world of work.

The objectives of this study were to answer the following four questions:

1. Can units on career development and the use of visual literacy techniques have an effect on pupil knowledge of the world of work?

2. Can units on career development and the use of visual literacy techniques have an effect on pupil interests in occupations?

3. Can units on career development and the use of visual literacy techniques have an effect on pupil attitudes toward the world of work?

4. What effect does reading level have on pupils' knowledge, interests and attitudes towards the world of work?

These questions led to the formulation of the following hypotheses which are concerned specifically with a sample of 158 grade 7 academically disadvantaged industrial arts pupils.

Hypotheses

$H1_o$: There are no statistically significant differences among posttest mean scores on the Pennsylvania Occupational Questionnaire among treatments.

$H2_o$: There is no statistically significant difference between posttest mean scores of high and low reading groups on the Pennsylvania Occupational Questionnaire.

$H3_o$: There are no statistically significant differences among posttest mean scores on the Vocational Development Inventory among treatments.

$H4_o$: There is no statistically significant difference between posttest mean scores of high and low reading groups on the Vocational Development Inventory.

$H5_o$: There are no statistically significant differences among the mean scores on the nine scales of the Picture Interest Inventory among treatments.

$H6_o$: There is no statistically significant difference between posttest mean scores of high and low reading groups on the nine scales of the Picture Interest Inventory.

Related Research

Several studies have suggested that visual literacy techniques are effective when used with educationally disadvantaged pupils. Fransecky (1969) found that elementary migrant pupils instructed by using photo-visual training techniques demonstrate a significantly higher rate of oral language response than those not so instructed. Fransecky stated, "The camera forces the child to concentrate on something--if only for a few seconds--in an effort to really see it. That discipline and the undeniable lure of the camera for kids hooks 'em and then you begin." The camera helps the child to say things that he might not be able to say in any other way. In essence, the camera becomes an essential tool of communication for a pupil with restricted opportunities for language development.

Fransecky's study further indicated that the camera can overcome many of the learning inadequacies of the educationally disadvantaged pupil. He believes that this can be accomplished by providing the extrinsic motivation atmosphere that is necessary for the development of intrinsic motivation. Ausubel (1964) appears to support Fransecky by stating that "extrinsic motivation must be nurtured before intrinsic motivation can be developed."

Jablonsky (1970) reinforces Fransecky's theory by stating:

> For illiterate or preliterate learners, the presentation of content in an audio-visual format is essential for language and concept development before motivation can be developed to struggle with the complexities of reading the printed word. (p. 1)

She goes on to say how much easier it is for a class to learn to understand directional aspects of map-reading skills when slides of the neighborhood around the school are used instead of some hypothetical location. How much richer the recall of a trip could be when the traditional experience chart is enlivened by pupil-taken photographs, which present and heighten the pupils' perceptions.

Comba (1971) supports Fransecky's theory of the camera as a communication tool. He reports that grade 7 pupils are of an age that is very receptive to photography. The pupils with a low academic rating have shown aptitude for and a keen interest in photography. Strandberg and Griffith (1968) found that the use of the camera with 4- and 5-year-old children significantly affects the length and complexity of a child's language as he describes the pictures he has made. Westcott (1969) reports that there was a significant difference between the mean scores on reading tests given to an experimental group of nonreaders who received photo-visual stories as the treatment and a control group of nonreaders who received a conventional approach to reading. With a sample of 100 preschool children in Munich, Graeb (1971) found that photography aroused a child's creativity, expanded his vocabulary and trained his memory.

Whitmore (1971) found that 1st grade pupils made significant academic gains in a class which had made extensive use of motion picture photography. The teacher- and pupil-produced movies were found to promote self-concept development and the learning of reading and mathematics. Besides showing that photography helps deprived children in communication skills, Whitmore has hypothesized in a recent study that pupils will show a gain in self-concept and in attitude toward school as a result of photography in the classroom. He is currently subjecting this hypothesis to experimental examination. In a similar study, Estierine (1970), using photography in the classroom, found that her emotionally disturbed children not only showed marked improvement in communication ability but also showed improvement in self-image, relationship with school and interculture understanding. In support of the findings of Whitmore (1971) and Estierine (1970), Hedges and Nicoletti (1972) found that by structuring the child's photographic activities, different changes in self-concept can be produced. Hedges (1972) also stated that "photography is a viable process for students from preschool to college to use photography to modify their self-concepts."

Studies by Whitmore (1971) and Estierine (1970) found that it is possible to actually develop positive affective behavior in disadvantaged pupils. Both researchers have capitalized on the motivational aspects of the camera and have combined real life situations as a setting for their programs. Whitmore's experimental treatment used pupils as subjects in movies. This technique seemed to enhance self-concept and attitude toward the learning process because pupils could see themselves as an important part of the lesson. Estierine used photographs taken by children in their ghetto setting as the subject matter for developing language skills. She also used role-playing techniques whereby children played the role of employer as well as employe. Children in the class then took pictures of each other in these roles. According to Goldberg (1967), the theory behind role playing developed from the reflected appraisals of significant others. How a child sees himself is an outgrowth of how people see him, especially those people about whom he cares

and who have meaning in his life. The camera can capture the child in the new role and prove to his peers and to himself that it is possible to actually achieve status represented by these roles. Concepts such as deferred gratification and the importance of schoolwork can at least begin to be developed by the use of this approach.

Brown (1968) agreed with Whitmore's hypotheses and Estierine's report in his study to determine the extent to which experiences with photography as a reinforcing agent or reward for acceptable classroom behavior could be used to modify deviant classroom behavior. His findings suggest experience with photography can have significant effects on changing deviant classroom behavior. Brown observed that as the experiment progressed, the pupils began to develop a positive image of themselves, especially when their pictures were displayed on the bulletin board and as their peers showed eagerness to see themselves in the pictures.

In another study, Youst (1970) developed a series of realistic nonprint materials on career guidance for elementary school children. A model was developed and tested which involved individualized on-site exploration of relevant questions on careers generated by pupils themselves. Each pupil visited work sites in the "real" world to help find answers to their questions. Photographic and audio media were used to convey and crystallize impressions of peers.

Jaromin's (1969) study is in agreement with most of the findings in visual literacy studies. He found that urban grade 8 boys from Rochester, New York made significant gains in an experimental class which made extensive use of visuals and cameras. Posttest results showed that the experimental and the control classes had improved almost at the same rate in grammar. However, the quality of the experimental class compositions was much better. Jaromin claims that the control class generally turned in the minimum amount of work. The experimental class worked long and hard at revision and generally turned in excellent work.

In summary, the main focus of visual literacy in education seems to be centered in the elementary and junior high schools of deprived neighborhoods. Researchers report significant results from most of the posttesting completed with specific improvements in reading and attitude towards school. The ways in which visual literacy learning experiences can best benefit children still need investigation. Griffith and Miner (1972) said that although visual literacy has profound implications for understanding and modifying individual and group behaviors, it has stimulated relatively little systematic research.

CHAPTER II

METHODS AND PROCEDURES

In this chapter the methods and criteria for selection of the sample will be presented. All of the instruments utilized in the study will be described including standardization, reliability and validity. The two experimental treatments and one control treatment will be described. In addition, the teacher training workshop, statistical analysis, design and the data gathering procedures will be discussed.

Sample

Subjects for this study were 158 boys (six sections) from the below average sections of grade 7 at the Harrisburg Middle School. All pupils at the Harrisburg Middle School were randomly assigned to high or low sections according to their Stanford Achievement Test (SAT) scores. Six of the 18 low sections were randomly selected to be used in the study. Each of the sections were then randomly assigned to one of the three treatments.

All pupils in the sample met the following criteria: (1) in the lower half of the class according to the SAT scores, (2) within a chronological age between 12 and 14, (3) enrolled in a school with 25 per cent or more of the pupils from low income families and (4) no gross physical or sensory handicaps which would inhibit performance on the assigned task.

The 158 pupils that met these criteria had the following characteristics:

1. Approximately 90 per cent of the pupils were black or from other minority groups.

2. Approximately 50 per cent of the pupils came from low income families.

3. The average chronological age was 13.

4. There were no gross physical or sensory handicaps which would inhibit performance on the assigned task.

5. The median reading score on the Slosson Oral Reading Test (SORT) was 4.7 grade level with a range from 0.6 to 8.1.

Instruments

Slosson Oral Reading Test (SORT). The SORT (Slosson, 1963) was used to determine the high and low reading groups of the sample. The SORT was designed to be given individually and is based on the ability to pronounce words at different levels of difficulty. The words have been taken from standardized school readers and the reading level obtained from testing represents median or standardized school achievement. Slosson obtained a reliability coefficient of .99 after a one-week interval. Also a correlation of .96 resulted between the SORT and the Standard Oral Reading Paragraphs with a sample of 108 pupils ranging from 1st grade through high school. Norming scales in grade levels range from 0.0 to high school. Slosson also determined reading grade levels are given in years and months.

Picture Interest Inventory (PII). The PII (Weingarten, 1958) was used as a pre- and postmeasure of pupil interest about the world of work. The PII was designed to measure the following interests: Interpersonal Service, Natural, Mechanical, Business, Esthetic, Scientific, Verbal, Computational and Time Perspective. Weingarten reports the test-retest correlations for these nine components obtained after a one-week interval ranged from .69 to .83 for grade 8 pupils. Table 1 shows the reliability coefficients from a sample of 80 grade 8 pupils. Examples of test items are found in Appendix A.

TABLE 1

Reliability Coefficient for the PII in Grade 8[1]

Field of Interest	r_{tt}
Interpersonal Service	.83
Natural	.90
Mechanical	.87
Business	.83
Esthetic	.78
Scientific	.84

[1]Data reported in table from Weingarten (1958, p. 5).

Using a sample of 418 junior high boys, Weingarten (1958) found that the PII has coefficients of correlation ranging from .56 to .77 with eight subtests in the Occupational Interest Inventory (OII), Intermediate, (Kuder (1948). Table 2 indicates the coefficients of correlation for the OII, Intermediate and the PII.

TABLE 2

Coefficients of Correlation for the OII, Intermediate and the PII[1]

Field of Interest		
PII	OII	r_{tt}
Interpersonal Service	Personal Social	.56
Natural	Natural	.77
Mechanical	Mechanical	.69
Business	Business	.71
Esthetic	The Arts	.61
Scientific	The Sciences	.67
Verbal	Verbal	.70
Computational	Computational	.59

[1]Data reported in table from Weingarten (1958, p. 13).

Norming scales on the PII range from grade 7 to adulthood. Individual profile development procedures are included in the manual. Examples of the test items are found in Appendix A.

Crites Vocational Development Inventory Form IV (VDI). The VDI (Crites, 1969) was used as a pre- and postmeasure of pupil attitude towards the world of work. According to Crites (1969), the VDI measures the degree of consistency of vocational choice, wisdom of vocational choice, vocational choice competencies and vocational choice attitudes.

In discussing the reliability of the VDI, Crites (1969) reported Kuder-Richardson 20 estimates ranging from .60 to .79 for grades 7 through 11. Table 3 shows the Kuder-Richardson 20 for each grade level. The results of the test-retest reliabilities for the VDI are reported for grades 6 through 12 in Table 4. The coefficients range from .65 to .84 with a mean of .74.

TABLE 3

Kuder-Richardson 20 for the Attitude Scale
in Grades 7 through 11[1]

Grade	N	K-R 20
7	300	.75
8	274	.72
9	281	.68
10	272	.72
11	127	.60

TABLE 4

Test-Retest Reliability Coefficients for the VDI
in Grades 6 through 12[1]

Grade	N	r_{tt}
6	255	.84
7	1328	.70
8	1301	.68
9	1349	.65
10	1313	.72
11	1059	.77
12	781	.75
		Mean = .74

[1]Data reported in tables from Crites (1969, p. 41 and 48).

The content validity of the VDI was appraised by Hall (1963) in a study using a panel of experts in counseling psychology who answered each of the items in the scale in what they valued to be the vocationally mature response. The interjudge agreement was 80 per cent. Hall considered the VDI to have acceptable content validity. Present norming

scales range from grade 7 to adulthood. Examples of the test items are found in Appendix A.

Pennsylvania Occuptional Questionnaire (POQ). The POQ (PDE, 1971) was used as a pre- and postmeasure of pupil knowledge of the world of work. The instrument was designed to measure pupil knowledge of job activities, job requirements and working conditions. The POQ is part of the Pennsylvania Educational Quality Assessment package for grade 7. In the fall of 1971, the POQ was administered to a randomly stratified sample of 2,640 grade 7 pupils in 90 schools. The Pennsylvania Bureau of Educational Quality Assessment (1971) revealed the following statistical information about the POQ:

Test Range	17.650
Kuder-Richardson 20 reliability	.769
Standard error or measurement	2.380
Mean difficulty	.588
Item-total correlation	.475

The POQ correlated with two subtests of the SAT. The verbal achievement correlation was .61 and the math achievement was .58. It was reported by Reardon, Senier and Lewis (1972) that the POQ reading level, according to the Fog Index of Readability, was at the middle grade 4 level. Examples of the test items are found in Appendix A.

Observation Forms A, B and C. Observation Forms A, B and C were used to measure teacher and pupil behavior in relation to the specific objectives of the lesson plan. The investigator and the industrial arts department head at the Harrisburg Middle School used the observation forms to rate teacher and pupil behavior. Copies of the forms are found in Appendix B. Table 5 shows the interrater reliability of the observation forms.

TABLE 5

Interrater Reliability of the Teacher Observation Forms

	Form A	Form B	Form C
Teacher I	.786	.707	.999
Teacher II	.878	.707	1.000

The two raters observed each teacher together on three different occasions for each form. Thus, each teacher was observed officially eight times simultaneously by the two raters during the 13-week period of the study. Form A was used to rate teachers on the preparation for the activity. Form B was designed to evaluate teacher and pupil behavior on field trips. The activity sessions were evaluated with Form C.

Treatments

The duration of the study was 13 weeks. A total of 158 grade 7 boys from the Harrisburg Middle School were randomly assigned to three treatment groups, each of which had two class sections. Treatment 1 received both visual literacy techniques (VLT) and the Great World of Work Curriculum Guide (GWWCG). A copy of the Great World of Work Curriculum Guide is found in Appendix C. Treatment 2 received the GWWCG without VLT. Both Treatment 1 and 2 made on-site visits to the following places: (1) Coca-Cola Plant, (2) Snyder Lumber Mill, (3) Brenner Motors, (4) Harris Lodge Apartments and (5) Harrisburg Steelton-Highspire Technical School. Treatment 3 experienced a conventional approach in industrial arts. All of the treatment groups devoted three periods (45 minutes each) per week to the assigned task for this 13-week study. In addition, all pupils devoted approximately one hour per week of outside study to treatment-related activities.

Treatment 1 used the GWWCG and the visual literacy mode of instruction. Visual literacy techniques such as visual sequencing, classifying and linking visual and verbal phenomena and a self-directed photographic endeavor were employed. Each pupil was given a Kodak X-15 camera, film and flash cubes. In addition, each pupil was given a workbook which included the written and photographic assignments for each task. Field trips to local industry and take-home assignments were used to make the curriculum more meaningful. The pupils discussed their interpretation of the task assignment with the class. Bulletin board displays were made with each pupil's interpretation of the task.

Treatment 2 used the GWWCG without the visual literacy mode of instruction. Each pupil used a 5 x 7 card for the assignments on each task. These cards were placed in the student's workbook. The bulletin board displays were made with each pupil's interpretation of the task assignment.

In short, both T_1 and T_2 made the same field trips and used the same curriculum. The only major difference between the two groups was the visual literacy mode of instruction which involved the use of the Kodak X-15 camera.

Treatment 3 followed the Pennsylvania guidance objective for industrial arts education (PDE, 1964) which states that "Pupils obtain

information concerning requirements of occupations and discover vocational interests and aptitudes." It was recommended that 10 to 20 per cent of the class time be spent on guidance-related activities. In addition, one hour per week of outside study related to the world of work was assigned to each pupil. Each contrast teacher used available classroom materials to aid in the instruction as well as any methods or techniques he might normally use to enhance the effectiveness of instruction on the world of work.

Teacher Training Workshops

The in-service workshop for participating teachers was held at the Harrisburg Middle School, Harrisburg, Pennsylvania, on January 14, 15 and February 21, 1972. Dr. John Shemick and Mr. Elmer Hensler, consultants on the project, participated in the workshop.

The agenda for the first day consisted of on-site visits to the following places: (1) Coca-Cola Plant, (2) Snyder Lumber Mill, (3) Brenner Motors and (4) Harris Lodge Apartments. A critique on how and when to expose the treatment classes to the industrial sites was made after each visit. On the second day, teachers were provided the following training: (1) using visual literacy techniques, (2) revising and evaluating lesson guides, (3) revising and evaluating student workbooks, (4) discussing bulletin board themes and (5) using the X-15 camera. On the third day, scheduling details were completed and the simulation of activities for the three treatments were conducted. The evaluation and observation instruments were also discussed.

Statistical Analysis

Analysis of variance was employed to analyze the pre- and posttest data. When significant F-ratios were found, the Tukey WSD comparison of difference between pairs of means was made for the data. The five per cent level of confidence was used to determine if the differences were significant.

Design

A 2 x 3 experimental design based upon Pretest-Posttest Control Design (Number 4) as described by Campbell and Stanley in the Handbook of Research on Teaching (Gage, 1963) was employed. The SORT reading scores for grade 7 were used to determine the high and low reading levels for analysis. Pupils with reading scores above the median were in the Reading Level I group and pupils with reading scores below the median were in the Reading Level II group. Two industrial arts teachers administered all three treatments. A further description of the design is:

	Treatment I	Treatment II	Treatment III
Reading Level I	The Great World of Work Curriculum with visual literacy techniques.	The Great World of Work Curriculum without visual literacy techniques.	Traditional industrial arts program.
Reading Level II	The Great World of Work Curriculum with visual literacy techniques.	The Great World of Work Curriculum without visual literacy techniques.	Traditional industrial arts program.

Data Gathering Procedures

Each pupil in the sample was tested with the PII, VDI and the POQ. The tests were administered by two industrial arts teachers and the investigator. Each pupil was tested in the familiar surrounding of his own classroom. Pretests were given from February 22 to March 5, 1972. Posttesting occurred between May 22 and June 5, 1972. An oral administration of the VDI and the POQ was conducted on both pre- and posttesting for the pupils who could not read the instruments. The SAT and SORT scores used in the study were taken from the records at the Harrisburg School District. Both instruments were administered by the Harrisburg School District in the fall of 1971.

CHAPTER III

PRESENTATION AND ANALYSIS OF DATA

The main purpose of this study was to investigate the effects of three types of instructional treatments on knowledge, attitude and interest toward the world of work.

The question arising is whether or not an instructional treatment that used both the Great World of Work Curriculum Guide (which included structured field trips) and visual literacy techniques is relatively more effective than an instructional treatment that only used the Great World of Work Curriculum Guide or an instructional treatment that used a traditional industrial arts program. A detailed description of the treatments is found on pp. 12 and 13. Another question that arises is what effect do reading levels have on pupils' knowledge, interest and attitude towards the world of work. These questions led to the formulation of six research hypotheses (see pp. 3 and 4) which are concerned specifically with a sample of grade 7 educationally disadvantaged boys from the Harrisburg School District.

Justification of the Experimental Design

In order to test the six null hypotheses, a 2 x 3 experimental design was employed. The range of scores on the SORT from 0.6 to 8.1 grade level justified the use of reading levels as a factor in the experiment. Lindquist (1956) contends that the introduction of levels to a design will increase the precision of the experiment. The two industrial arts teachers were not used as a factor in the experimental design since there was no statistically significant difference between them on the results of observation forms A, B or C. Table 6 indicates the findings of each form.

Statistical Procedures

The computer library programs--Analysis of Variance with Repeated Measures (ANOVR), Games and Gray (1971), Follow-Up After Analysis of Variance (FOLUP), Yancey, Howell and Games (1971) and the Analysis of Covariance (ACV), Craig (1963)--were used to analyze the data. The output of ANOVR was used in FOLUP to do post-hoc data analysis of the pre- and posttest mean scores of the POQ, VDI and PII via the Tukey WSD. The ACV was used when significant pretest mean score differences were found. Thus, a 2 x 3 design was used to enable comparison of the main effects of treatments and reading levels as well as the assessment of interaction effects of these variables on the POQ, VDI and PII.

TABLE 6

Summary for Observation Forms A, B and C

Form	Teacher 1 N	Teacher 1 Mean	Teacher 2 N	Teacher 2 Mean	t
A					
Part 1	8	33.50	8	32.87	0.314
B					
Part 1	4	25.20	4	25.40	0.025
Part 2	2	3.50	2	3.00	1.00
C					
Part 1	4	26.50	4	26.75	0.277
Part 2	4	10.75	4	10.25	0.6325
Part 3	2	4.00	2	3.50	1.00

Results and Discussion

$H1_o$ There are no statistically significant differences among posttest mean scores on the POQ among T_1, T_2 and T_3.

Table 7 summarizes the ANOVR for all experimental groups on the POQ. The between subjects F-ratios were uninterpretable because pre- and posttest data were combined in this analysis. An inspection of the within subjects F-ratios revealed a significant treatment by testing interaction A x J at the .05 level. This interaction means that there were differences among the treatments in both pre- and posttest data.

In order to determine the source of the difference, a Tukey WSD comparison of both pre- and posttest means was conducted. The results of this procedure are shown in Table 8. The data in this table show a significant difference between the posttest means of T_2 and T_3 and no significant difference between the posttest means of T_1 and T_3. However, an inspection of Table 9 shows that T_1 and T_2 posttest means are almost equal. The omnibus F-ratio of the ANOVR may be obscuring a significant difference between T_1 and T_3. The pretest differences between T_1 and T_2 may have also contributed to the lack of significance between T_1 and T_3 in this analysis.

TABLE 7

Analysis of Variance Summary for the POQ

Source	Mean Squares	df	F-Ratio
Between Subjects			
Treatment (A)	129.792	2	3.78*
Reading (B)	1116.57	1	32.59*
A x B	19.8479	2	0.57
Error	34.2586	152	
Within Subjects			
Testing (J)	623.848	1	390.51*
A x J	46.0063	2	28.79*
B x J	5.58228	1	3.49
A x B x J	0.369232	2	0.23
Error	1.59749	152	

*Significant at the .05 level

TABLE 8

Tukey WSD Summary of Pre- and Posttest Means on the POQ

Mean Contrast T - T	Difference	t	df	Critical Value of t
Pretest				
2 1	2.0900	2.49*	154	2.38
2 3	1.2900	1.58	154	2.38
3 1	0.8000	0.971	154	2.38
Posttest				
2 3	2.9400	3.606*	154	2.38
2 1	1.1400	1.360	154	2.38
1 3	1.8000	2.185	154	2.38

*Significant at the .05 level

TABLE 9

Pre- and Posttest Means, Standard Deviations
And Adjusted Posttest Means for the POQ

Treatment	Pretest Means	Pretest S.D.	Posttest Means	Posttest S.D.	Adjusted* Posttest Means	Mean Differences
1 (N=50)	11.22	4.95	15.26	5.06	16.10	4.04
2 (N=52)	13.30	4.69	16.40	4.36	15.42	3.10
3 (N=56)	12.01	4.61	13.46	4.02	13.61	1.45

*From the analysis of covariance program.

Further analysis of the data used analysis of covariance (Craig, 1963) to adjust for preexperimental differences (see Table 10). The pretest scores were used as the covariate and a statistically significant difference was obtained. The adjusted posttest means from this analysis are reported in Table 9.

TABLE 10

Analysis of Covariance on the POQ

Source	Mean Squares	df	F-Ratio
Treatment	89.129171	2	30.947*
Error	2.880038	154	
Total		154	

*Significant at the .05 level

To determine the source of this difference, all possible pairs of adjusted posttest means were compared using the Tukey WSD procedure. The results of this comparison are shown in Table 11. It was found that T_1 and T_2 did not differ significantly. Since there were significant differences favoring both T_1 and T_2 over T_3, the null hypothesis was rejected.

TABLE 11

Tukey WSD Summary of Adjusted Posttest Means on the POQ

Mean Contrast		Difference	t	df	Critical Value of t
T	T				
1	3	2.4937	7.552*	154	2.38
1	2	0.6825	2.031	154	2.38
2	3	1.8112	5.542*	154	2.38

*Significant at the .05 level

H2 There is no statistically significant difference between posttest mean scores of high and low reading groups on the POQ.

The F-ratio of 3.49 (see Table 7, p. 17) shows that the interaction of reading by testing (B x J) was nonsignificant; therefore, the null hypothesis was retained.

This lack of a significant interaction between high and low reading groups on the POQ is illustrated in Figure 1.

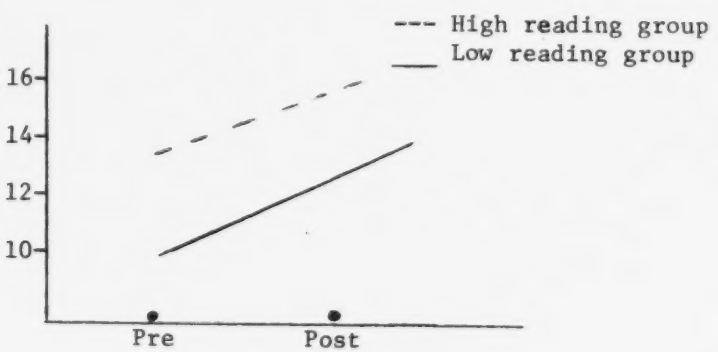

Figure 1

POQ Scores for High and Low Reading Groups

$H3_o$ There are no statistically significant differences among posttest mean scores on the VDI among T_1, T_2 and T_3.

Table 12 summarizes the ANOVR for all experimental groups on the VDI. The between subjects F-ratios were uninterpretable because pre- and posttest data were combined in this analysis. Inspection of the within subjects F-ratios revealed a significant treatment by testing interaction A x J at the .05 level. This interaction means that there were differences among treatments in both the pre- and posttest data. In order to determine the source of the difference, a Tukey WSD Comparison of both pre- and posttest means was conducted. The results of this analysis are shown in Table 13. The comparison showed no significant difference on the pretest and significant differences on the posttest between T_2 and T_3 and T_1 and T_3.

TABLE 12

Analysis of Variance Summary for the VDI

Source	Mean Squares	df	F-Ratio
Between Subjects			
Treatment (A)	169.813	2	3.50*
Reading (B)	365.823	1	7.55*
A x B	172.756	2	3.56*
Error	48.4374	152	
Within Subjects			
Testing (J)	612.658	1	218.61*
A x J	43.1650	2	15.40*
B x J	1.53165	1	0.54
A x B x J	0.751911	2	0.26
Error	2.80248	152	

*Significant at the .05 level

TABLE 13

Tukey WSD Summary of Pre- and Posttest Means on the VDI

Mean Contrast T - T	Difference	t	df	Critical Value of t
Pretest				
2 3	1.5620	1.602	154	2.38
2 1	1.2450	1.242	154	2.38
1 3	0.3170	0.322	154	2.38
Posttest				
2 3	3.4100	3.498*	154	2.38
2 1	0.6600	0.658	154	2.38
1 3	2.7500	2.792*	154	2.38

*Significant at the .05 level

TABLE 14

Pre- and Posttest Means, Standard Deviations
And Adjusted Posttest Means for the VDI

Treatment	Pretest Means	Pretest S.D.	Posttest Means	Posttest S.D.	Adjusted* Posttest Means	Differences
1 (N=50)	74.62	4.89	78.46	4.51	78.71	3.84
2 (N=52)	75.86	5.29	79.11	4.76	78.31	3.25
3 (N=56)	74.30	5.90	75.71	5.75	76.23	0.81

*From the analysis of covariance program

In view of the foregoing analysis and a coefficient of correlation of .88 between pre- and posttest results for the VDI, analysis of covariance was used (see Table 15, p. 22) to adjust for preexperimental differences. The pretest scores were used as the covariate and a statistically significant difference was obtained favoring both T_1 and T_2 over T_3 (see above Table 14 for adjusted posttest means). Since there were significant differences between treatments, the null hypothesis was rejected.

TABLE 15

Analysis of Covariance on the VDI

Source	Mean Squares	df	F-Ratio
Treatment	95.149379	2	19.540*
Error	4.869363	154	
Total		156	

*Significant at the .05 level

TABLE 16

Tukey WSD Summary of Adjusted Posttest Means on the VDI

Mean Contrast	Difference	t	df	Critical Value of t
$\underline{T} - \underline{T}$				
1 3	2.4782	5.778*	154	2.38
1 2	0.3974	0.910	154	2.38
2 3	2.0808	4.901*	154	2.38

*Significant at the .05 level

$H4_o$ There is no statistically significant difference between posttest mean scores of high and low reading groups on the VDI.

The F-ratio of .547 (see Table 12, p. 20) shows that the interaction of reading by testing (B x J) was not significant. The null hypothesis was retained. Figure 2 pictures the mean scores for the high and low reading groups.

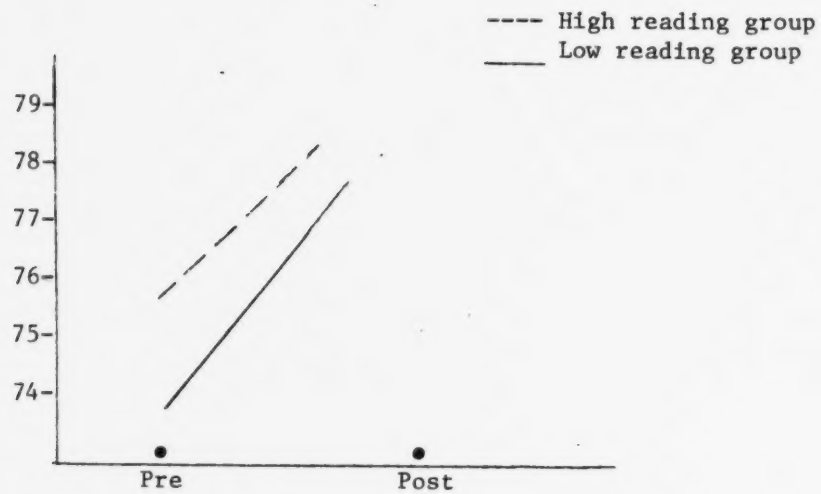

Figure 2

VDI Scores for High and Low
Reading Groups

$H5_o$ There are no statistically significant differences among posttest mean scores on the nine scales of the PII among T_1, T_2 and T_3.

The F-ratios for the nine scales on the PII are summarized in Table 17. The between subjects F-ratios were uninterpretable because pre- and posttest means are combined in the analysis. The within subjects F-ratios revealed nonsignificant treatment by testing interaction A x J at the .05 level. This means that no significant differences exist in the combined pre- posttesting among the nine scales. The null hypothesis was not rejected. The analysis of variance tables (22, 23, 24, 25, 26, 27, 28, 29 and 30) for each scale on the PII are reported in Appendix E.

$H6_o$ There is no statistically significant difference between posttest mean scores of high and low reading groups on the nine scales of the PII.

The F-ratios on the repeated measures for reading are found in Table 17. The within subjects F-ratios revealed a nonsignificant reading by testing interaction.

TABLE 17

F-Ratios for the Nine Scales on the PII

Field of Interest	Between Subjects F-Ratio			Within Subjects F-Ratio			
	A	B	AxB	J	AxJ	BxJ	AxBxJ
Interpersonal Service	.303	.027	1.210	5.200*	.625	.472	5.597*
Natural	3.606*	4.493*	.221	.000	.202	.857	1.393
Mechanical	.883	.000	4.026*	.019	1.369	.129	.938
Business	.425	3.160	.239	.496	.083	.001	3.717*
Esthetic	.538	.123	2.673	2.209	.088	2.127	1.468
Scientific	.018	.488	.564	.381	2.977	1.801	.973
Verbal	.348	1.543	.540	5.718*	2.628	.109	2.513
Computational	.769	3.808*	.233	2.760	.174	.129	1.234
Time Perspective	.891	.477	1.197	7.962*	1.153	1.828	3.128*

*Significant at the .05 level

NOTE: Treatment (A), Reading (B) and Testing (J)

The Pearson Product Moment Correlation was used to correlate each of the 22 variables. The matrix is presented in Table 18. All of the POQ and VDI variables were significantly correlated at the .05 level. There were only a few PII variables that were significantly correlated at the .05 level with POQ and VDI variables. Several of the subtests on the PII were significantly intercorrelated.

TABLE 18

Correlations Among Dependent Variables

	Pretest											Posttest										
	VDI 1	PDE 2	PII 1 3	PII 2 4	PII 3 5	PII 4 6	PII 5 7	PII 6 8	PII 7 9	PII 8 10	PII 9 11	VDI 12	PDE 13	PII 1 14	PII 2 15	PII 3 16	PII 4 17	PII 5 18	PII 6 19	PII 7 20	PII 8 21	PII 9 22
1	---	.40*	-.17*	.10	.09	-.05	-.34*	.15	-.18*	.05	-.03	.88*	.39*	-.07	-.03	.19*	.03	-.23*	.03	-.11	.07	-.09
2			-.19*	-.08	.04	.02	-.15	.21*	-.10	.09	.09	.43*	.90*	-.08	-.09	.02	.05	-.16*	.07	-.03	.11	-.09
3				-.15*	-.59*	.27*	.08	-.36*	.60*	.20*	.21*	-.15	-.22*	.61*	-.11	-.36*	.24*	.04	-.19*	.36*	.05	.21*
4					-.13	-.73*	-.34*	.12	-.33*	-.47*	-.17*	.04	-.10	-.15	.63*	.01	-.47*	-.16*	.10	-.26*	-.31*	-.14
5						-.11	.03	.16*	-.52*	-.10	-.27*	.10	.06	-.41*	-.08	.60*	-.16*	.07	.15	-.33*	-.02	-.21*
6							.08	-.29*	.58*	.68*	.27*	-.02	.03	.28*	-.52*	-.11	.71*	.03	-.19*	.43*	.47*	.22*
7								-.47*	.06	-.30*	.09	-.30*	-.16*	.03	-.16*	-.04	.05	.60*	-.28*	.09	-.22*	-.07
8									-.34*	.05	-.09	.09	.18*	-.28*	.19*	.20*	-.27*	-.28*	.52*	-.28*	-.04	-.07
9										.53*	.36*	-.18*	-.11	.46*	-.25*	-.33*	.44*	-.03	-.26*	.43*	.26*	.30*
10											.44*	.04	.09	.20*	-.34*	-.04	.44*	-.27*	.05	.30*	.59*	.35*
11												-.04	.06	.08	-.08	-.17*	.17*	-.07	.09	.16*	.16*	.34*
12													.51*	-.06	-.11	.19*	.03	-.19*	.03	-.10	.07	.05
13														-.14	-.18*	.12	.05	-.14	.12	-.07	.14	.03
14															-.17*	-.54*	.30*	-.08	-.33*	.58*	.13	.25*
15																-.13	-.63*	-.26*	.10	-.26*	-.38*	-.06
16																	-.16*	.06	.22*	-.44*	-.01	-.20*
17																		.11	-.36*	.51*	.53*	.10
18																			-.37*	.07	-.27*	-.20*
19																				-.42*	-.00	.12
20																					.44*	.26*
21																						.26*
22																						---

*p < .05

CHAPTER IV

SUMMARY, INTERPRETATIONS, CONCLUSIONS AND RECOMMENDATIONS

This chapter includes the presentation of a summary, interpretations, conclusions and recommendations based upon the analysis of data found in Chapter III. The findings of this study were presented in terms of six null hypotheses. The conclusions should only be considered within the framework of the assumptions made and the understanding of the conditions under which the study was conducted.

Summary

The intent of this study was to determine the relative effectiveness of three types of instructional treatments on knowledge, interest and attitude toward the world of work.

Sample. Subjects for this study were 158 boys from the below average sections of grade 7 at the Harrisburg Middle School. The subjects had the following characteristics: 90 per cent were black, 50 per cent came from low income families and the median reading score was 4.7 grade level, with a range from 0.6 to 8.1.

Testing. The Vocational Development Inventory Form IV was used as a pre- and postmeasure of pupil attitude toward the world of work. Pupils' knowledge of the world of work was assessed with the Pennsylvania Occupational Questionnaire. The Picture Interest Inventory was used as a pre- and postmeasure of pupil interest about the world of work. Observation Forms A, B and C were used to assess teacher behavior on treatment-related activity.

Treatments. Treatment 1 received both visual literacy techniques and the Great World of Work Curriculum Guide. The VLT involved giving each pupil a Kodak X-15 camera, film and flash cubes. The GWWCG provided each pupil with a workbook which included the written and photographic assignments for each task including five field trips. Treatment 2 used the GWWCG without VLT. Treatment 3 was a traditional industrial arts program according to the Department of Education guidelines. All treatment groups devoted three periods (45 minutes each) per week to the assigned tasks for 13 weeks. In addition, all pupils devoted approximately one hour per week of outside study to treatment-related activities.

Workshop. The in-service workshop for participating teachers was held at the project site on January 14, 15 and February 21, 1972. Dr. John Shemick and Mr. Elmer Hensler, consultants, participated in the workshop. The following aspects of the study were covered: (1) tra'ning

teachers on visual literacy techniques, (2) revising and evaluating student workbooks, (3) revising and evaluating lesson guides, (4) using the X-15 camera, (5) critiquing on how and when to expose the treatment classes to the industrial sites and (6) using simulation activities for the three treatments.

Design. A 2 x 3 experimental design based upon pretest-posttest control design was employed. The SORT reading scores for grade 7 were used to determine the high and low reading level for analysis. Pupils with reading scores above the median were in the high reading group and pupils with reading scores below the median were in the low reading group.

Data Gathering Procedures. Each pupil in the sample was tested with the three measures. Pretests were given from February 22 to March 5, 1972. Posttesting occurred between May 22 and June 5, 1972. The Stanford Achievement Test and SORT scores used in the study were taken from the records of the Harrisburg School District. Both instruments were administered by the Harrisburg School District in the fall of 1971.

Statistical Analysis. Analysis of variance and covariance was employed to analyze the pre- and posttest data. When significant F-ratios were found, the Tukey WSD comparison of difference between pairs of means was made for the data. The five per cent level of confidence was used to determine if the differences were significant.

Interpretations

The Effects of the Three Types of Instructional Treatments on the Dependent Measures. Null hypothesis $H1_o$ was concerned with the effectiveness of the three different treatments on pupils' knowledge of the world of work as measured by the Pennsylvania Occupational Questionnaire (POQ). The result of the analysis of data showed that pupils using the Great World of Work Curriculum Guide (GWWCG) had statistically significant higher mean scores on the POQ than pupils in a traditional industrial arts program. Further, the addition of visual literacy techniques (VLT) to the GWWCG did not make a statistically significant difference on pupils' mean scores on the POQ. Nevertheless, pupils using the GWWCG with VLT had statistically significant higher adjusted mean scores on the POQ than pupils in a traditional industrial arts program. It should also be noted that the adjusted mean difference between T_1 and T_2 reached the .10 level of significance. This difference favored T_1.

The failure to obtain a significant difference at the accepted criteria with the added use of VLT was a particularly unexpected finding. While it is possible that in actuality no differences exist, it is surprising since it is the visual literacy factor more than any other that is referred to in the review of literature as one of the key instructional techniques for disadvantaged pupils. Research by Fransecky (1970), Westcott (1969)

and Comba (1968) found that the added use of photography and other VLT to a curriculum significantly increases learning. A second possibility is that the differences do exist but are too small to assess with the available measuring instruments. However, this is unlikely since a statistically significant gain was made with only using the GWWCG. Research by Wurtzel (1972), Harrison (1972), Faust, Goldberg, Platt and Styles (1968) support the findings that an occupational exploration curriculum does increase vocational awareness of the pupils. Possibly a longer experimental period would increase the potency of VLT. Another recommendation could be a longer orientation period on VLT for both teachers and pupils.

Null hypothesis $H3_0$ was concerned with the effectiveness of three different treatments on pupils' attitudes toward the world of work as measured by the Vocational Development Inventory (VDI). Pupils using the GWWCG had statistically significant higher scores on the VDI than pupils in a traditional industrial arts program. The use of VLT with the GWWCG did not make a statistically significant difference in pupils' mean scores on the VDI. On the other hand, the group that used VLT with the GWWCG had statistically significant higher mean scores on the VDI than pupils in a traditional industrial arts program.

Again the failure to obtain a significant difference with the added use of VLT was surprising. Most of the literature supports VLT as an effective mode of instruction to use with the educationally disadvantaged. However, it is pointed out in the literature that Kohl (1967), Ducharme and Fraisse (1965) agree with Travers (1964) that pupils do not need a wealth of stimuli in order to recognize the attributes of an object or situation that place it in a particular category. Travers maintains the realistic presentation of much content provides unnecessary detail and that the real objective of visual education is "not so much to bring the pupil into close touch with reality, but to help pupils become more effective in dealing with reality." In a more recent study, Rush (1971) found that senior high pupils do not significantly gain on criterion tests resulting from the presentation of visual materials varying in amounts of time.

Similar findings in $H1_0$ and $H3_0$ seem to support the notion that VLT did not significantly affect the learning ability of pupils. It is possible, as pointed out earlier, that a longer experimental and orientation period could increase the potency of VLT. Griffith and Miner (1972) conclude that although visual literacy has profound implications for understanding and modifying individual and group behavior, it has stimulated relatively little systematic research. Very few of the studies with VLT are using rigorous statistical tests or designs. This may be the reason why so many studies seem to have successful results.

In regard to $H1_0$ and $H3_0$, the GWWCG without VLT was significantly higher than the traditional industrial arts program. The GWWCG improved the pupils' vocational attitudes as measured by the VDI. Similar findings

were made by Asburg (1967). He compared counseled and noncounseled educationally disadvantaged grade 8 pupils (N = 108) and found increases on the VDI for those counseled pupils who had been pretested. Similarly, Bovee (1967) has reported significant gains at the .01 level on the VDI for two experimental groups, one with precounseling plus counseling and the other with counseling only, as compared with a noncounseled control group. Although these studies were counseling in nature and different from an occupational awareness curriculum, they appear to support changing vocational attitudes with a treatment over a relatively short period of time.

Null hypothesis $H5_o$ was concerned with the effects of three different treatments on pupils' vocational interests as measured by the Picture Interest Inventory (PII). There was no statistically significant difference in vocational interest among the three treatment groups as measured by any of the nine scales of the PII.

Some studies supported the use of an occupational curriculum for changing vocational interest while other studies found that an occupational curriculum does not make a statistically significant change in interest patterns. In a three-year experimental study involving disadvantaged grade 9 boys from Philadelphia, Hill (1965) found that occupational information study tends to promote change in the selection of vocational interests as measured by the Hackman-Gaither Vocational Interest Inventory.

In contrast, Toporowski (1961) found that an occupational course which ran for 77 class periods failed to significantly change interest patterns of urban high school pupils as measured by the California Occupation Interest Inventory. In agreement with Toporowski, Jeffs (1965) concluded that occupational information units had little effect on the vocational interest patterns of grade 12 educationally disadvantaged pupils. Jeffs (1961) and Toporowski (1960) experimental periods were no longer than one semester, whereas Hill's study was three years. Perhaps this is the reason for the greater difference in the longer study.

In summary, the GWWCG proved to be an effective way to enhance the occupational awareness of educationally disadvantaged pupils. The development of vocational attitudes also were promoted by using the GWWCG. On the other hand, the GWWCG did not significantly change vocational interests patterns. Perhaps a longer experimental period would increase the degree of effectiveness of the curriculum in this respect.

The Effects of Reading Levels on the Dependent Measures. Null hypotheses $H2_o$, $H4_o$ and $H6_o$ were concerned with the effects of reading levels. In this study reading levels did not significantly affect the results.

Conclusions

The conclusions derived from this study are presented in the same order as the hypotheses cited in Chapter I.

1. Pupils using the Great World of Work Curriculum Guide (GWWCG) with and without VLT had statistically significant higher scores on the Pennsylvania Occupational Questionnaire (POQ) than pupils in a traditional industrial arts program. The addition of visual literacy techniques (VLT) to the GWWCG did not make a statistically significant difference in pupils' scores on the POQ.

2. The reading level of a pupil was not a statistically significant factor in affecting the mean scores on the POQ among the three treatment groups.

3. Pupils using the GWWCG with and without VLT had statistically significant higher scores on the Vocational Development Inventory (VDI) than pupils in a traditional industrial arts program. Using VLT with the GWWCG did not make a statistically significant difference in pupils' scores on the VDI.

4. The reading level of a pupil was not a statistically significant factor in affecting the mean scores on the VDI among the three treatment groups.

5. There was no statistically significant difference in vocational interest among the three treatment groups as measured by any of the nine scales of the Picture Interest Inventory (PII).

6. High and low reading levels were not statistically significant factors in changing vocational interests as measured by any of the nine scales of the PII when exposed to the three treatments.

Recommendations

Based upon the experience gained in conducting this study, the following recommendations for further research are offered:

1. Such studies as this one should be conducted for a semester or a year rather than just 13 weeks.

2. Future research designed to determine differences by reading levels or some other factor such as intelligence should divide subjects by thirds (high, average and low) rather than above and below the median. This may allow differences on criterion measures between high and low reading levels to appear.

3. More research is needed on use of cameras to apply visual literacy techniques effectively.

4. Field trips should be thoroughly planned and structured so that pupils are looking for answers to questions. Also, simple written assignments should be used to provide learning reinforcement after field trips.

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GLOSSARY OF TERMS

Educationally disadvantaged. "Poor educational background, lack motivation, severely deficient in basic skills, retarded two or more years in academic achievements, overaged for grade placement, low achievement records and dropout potentials, (but not identified as special education students.)" (School Administrators Handbook, 1971, p. 10)

> Career education. Career education provides for a broad approach to preparation for citizenship; provides job information and skill development; and also helps individuals develop attitudes about the personal, psychological, social and economic significance of work in our society. It develops and fosters vocational and recreational interest of individuals to help prepare for a well-rounded living in a world in which leisure time is increasing and greater opportunity for a self-expression through creative is available. (Marland, 1971, p. 2)

Industrial arts. ". . . Those phases of general education that deal with industry--its organization, materials, occupations, processes and products--and with the problems resulting from the industrial and technological nature of society. (Wilber and Pendered, 1967, p. 2)

> Objectives of career education in industrial arts. Career education objectives in industrial arts are brought about by: (1) a knowledge of how materials are processed and fabricated; (2) an understanding of the interrelationship of the tools, machines, materials and the man in industrial processes; (3) the evaluation of the learner's attitude towards self, craftsmanship, and work; (4) the utilization of such work for health, recreation, and economic values, and (5) the development of a favorable attitude towards creative thinking. (Worthington, 1972, p. 26)

> Visual literacy. Refers to a group of vision-competencies a human being can develop by seeing and at the same time having and integrating other sensory experiences. The development of these competencies is fundamental to normal human learning. When developed, they enable a visually literate person to discriminate and interpret the visible actions, objects, and symbols, natural or man-made, that he encounters in his environment. Through the creative use of these competencies, he is able to communicate with others. Through the appreciative use of these competencies, he is able to comprehend and enjoy the master-works of visual communication. (Debes, 1968, p. 962)

APPENDIX A

Pennsylvania Occupational Questionnaire (POQ)

Three examples of 31-item test

1. Who do you think would have to do the most lifting of heavy objects?

   a. bank guard
   b. farmer
   c. barber
   d. cashier

2. Which job requires the least time in school?

   a. engineer
   b. accountant
   c. physician
   d. plumber

3. Which of these jobs has the highest starting salary?

   a. nurse
   b. waiter
   c. engineer
   d. 2nd grade teacher

Vocational Development Inventory (VDI)

Three examples of a 50-item true-false test

1. Once you choose a job, you cannot choose another one.
2. In order to choose a job, you need to know what kind of person you are.
3. I plan to follow the line of work my parents suggest.

Picture Interest Inventory (PII)

Part I - 53 items

An example of a free choice item. (The examinee has a choice of which picture he likes or dislikes.)

1. a bricklayer building a fireplace
2. an accountant using an adding machine
3. a farmer feeding chickens

Part II - 30 items

Examples of forced choice items. (The examinee has to make a choice of which picture he likes or dislikes on each item.)

1. a judge at work in a court room
2. a real estate salesman showing a house
3. a photographer at work in his studio

APPENDIX B

OBSERVATION FORM A
PREPARATION FOR THE ACTIVITY

Teacher_____ School_____

Date_____ Time_____ Treatment Group_____

The teacher . . .	High		Average		Low
1. Arranges pupils so that all can see and hear.	5	4	3	2	1
2. Has all the required materials and equipment on hand and properly arranged.	5	4	3	2	1
3. States the task and objectives.	5	4	3	2	1
4. Was following the lesson plan.	5	4	3	2	1
5. Maintains interest throughout the lesson.	5	4	3	2	1
6. Talks directly and clearly to pupils.	5	4	3	2	1
7. Performs operations skillfully.	5	4	3	2	1
8. Elicits pupil participation.	5	4	3	2	1

Independent Observations or Comments

FORM A - ITEM DEFINITIONS

1. The pupils should have the opportunity to see as well as hear the lesson. A rating of five should be given to a teacher that arranges the pupils so that all can see and hear. A rating of one should be given to a teacher that does not attempt to arrange the pupils.

2. Any activity session will be a failure if the equipment is not on hand or properly arranged. Each lesson plan has a list of the required materials and arrangements. A rating of five should be given to a teacher that has all the equipment and materials on hand and properly arranged. A rating of one should be given to a teacher that does not have the bare minimum on hand. (The rater should have a copy of the lesson plan when rating the treatment.)

3. Each lesson will have a lesson task that should be stated clearly and be understood by all the pupils.

4. Every lesson plan has steps that should be followed. A rating of five should be given if every step is carried out. A rating of one should be given if the teacher does not attempt to follow the steps in the lesson plan.

5. The teacher was able to hold the attention of the pupils throughout the lesson. Pupil behavior should be such that they are at least looking at the teacher and directing questions to the lesson. The pupils should conform to the regulations of the teacher.

6. The teacher talks directly to the pupils, not the blackboard, the floor or the object of the lesson. The teacher uses words appropriate for the pupil's age level. If new words or terms must be used because of the subject nature, the teacher should stop and explain the terms.

7. The teacher should be able to perform any operation that is required in the lesson. For example, use the equipment properly, write on the blackboard neat and clear.

8. The lesson should not be a teacher's show, but should be entered actively by the pupils. The teacher should encourage pupil questions and direct questions to pupils.

APPENDIX B (continued)

OBSERVATION FORM B
FIELD TRIP

Teacher_____ School_____

Date_____ Time_____ Treatment Group_____

The teacher . . .	High		Average		Low
1. Prepares pupils to see the main points of interest on the field trip.	5	4	3	2	1
2. Directs pupils in relation to the physical conditions of the field trip.	5	4	3	2	1
3. Stresses safety precautions.	5	4	3	2	1
4. Elicits pupil participation.	5	4	3	2	1
5. Provides opportunity for pupils to perform the assigned task.	5	4	3	2	1
6. Maintains interest throughout the field trip.	5	4	3	2	1

The pupils . . . (Treatment I Only)	Per Cent of Pupils				
7. Photographic equipment was in good working condition.	100	75	50	25	10 or less
8. Were using the cameras properly.	100	75	50	25	10 or less

Independent Comments or Observations

FORM B - ITEM DEFINITIONS

1. The teacher should restate the task assignment at the start of a field trip. A short summary of the preparation session should also be included at the start of a field trip. A rating of five should be given when a teacher does all that is stated above. A rating of one should be given to a teacher when he only states something like "remember what we talked about in class" or fails to mention anything about the task or summary. (The rater should have a copy of the lesson plan when rating the treatment.)

2. The teacher should direct pupils in regard to lighting, physical barriers, weather conditions, etc. For example, the teacher should direct pupils to go on in another direction for better viewing. A rating of five should be given when the pupils are directed in regard to every obvious physical condition. A rating of one should be given when the teacher does not direct the pupil in regard to obvious physical barriers.

3. On any field trip, there is safety hazard. The teacher should stress and enforce the safety regulations that are prescribed for visitors on an industrial tour.

4. During the tour, the teacher should encourage pupil questions either directed to the guide or himself. The teacher should also be asking questions.

5. The teacher should be directing the pupils in the most realistic way. For example, a pupil should be directed to areas where critical steps in a mass-production product are accomplished. More specifically, a pupil should start from the beginning of a mass-production process and see the operation to its completion rather than being introduced at some midpoint.

6. Pupil behavior should be such that they are at least looking at the major points of the tour. The pupils should not be misbehaving. For example, pupils should not be pushing, talking out-of-turn, etc.

7. The camera, film and flash cubes should be in good working condition. For example, the flash cubes should work.

8. The pupils should use the camera in the proper manner. Camera movement spoils more pictures than anything else. The pupils should have a good grip on their camera and gently squeeze the shutter release.

APPENDIX B (continued)

OBSERVATION FORM C
ACTIVITY SESSION

Teacher_____ School_____

Date_____ Time_____ Treatment Group_____

The teacher . . .	High		Average		Low
1. Has the required materials and equipment on hand and properly arranged.	5	4	3	2	1
2. States the task and objectives.	5	4	3	2	1
3. Was following the lesson plan.	5	4	3	2	1
4. Maintains interest throughout the activity session.	5	4	3	2	1
5. Performs operations skillfully.	5	4	3	2	1
6. Talks directly and clearly to pupils.	5	4	3	2	1
The pupils . . .	Per Cent of Pupils				
7. Were sharing and helping.	100	75	50	25	10 or less
8. Were seeking support, assistance and information.	100	75	50	25	10 or less
9. Were actively engaged in the assigned task.	100	75	50	25	10 or less
10. Completed the assigned task.	100	75	50	25	10 or less
(Treatment I Only)					
11. Photographic equipment was in good working condition.	100	75	50	25	10 or less
12. Were using the cameras properly.	100	75	50	25	10 or less

Independent Comments or Observation

FORM C - DEFINITION

1. Any activity session will be a failure if the equipment is not on hand or properly arranged. Each lesson plan has a list of the required materials and arrangements. A rating of five should be given to a teacher that has all the equipment and materials on hand and properly arranged. A rating of one should be given to a teacher that does not have the bare minimum on hand. (The rater should have a copy of the lesson plan when rating the treatment.)

2. Each activity will have a task that should be stated clearly and be understood by all the pupils.

3. Every lesson plan has steps that should be followed. A rating of five should be given if every step is carried out. A rating of one should be given if the teacher does not attempt to follow the steps in the lesson plan.

4. The teacher was able to hold the attention of the pupils throughout the activity. The pupils should not be annoying or bothering other pupils. The pupils should conform to the regulations of the teacher.

5. The teacher should be able to perform any operation that is required in the activity. For example, the teacher was using the Kodak X-15 camera in a skillful manner.

6. The teacher talks directly to the pupils, not the floor or walls. The teacher uses words appropriate for the pupil's age level.

7. The pupils were contributing ideas, interests, materials, helping, responding by showing feeling (laughing, smiling, etc.) in audience situation.

8. The pupils were asking teachers or significant peers for help or support.

9. Each pupil should be actively engaged in the assigned task. For example, if the activity is making bulletin boards displays, the pupils should not be reading a book or doing nonrelated activities.

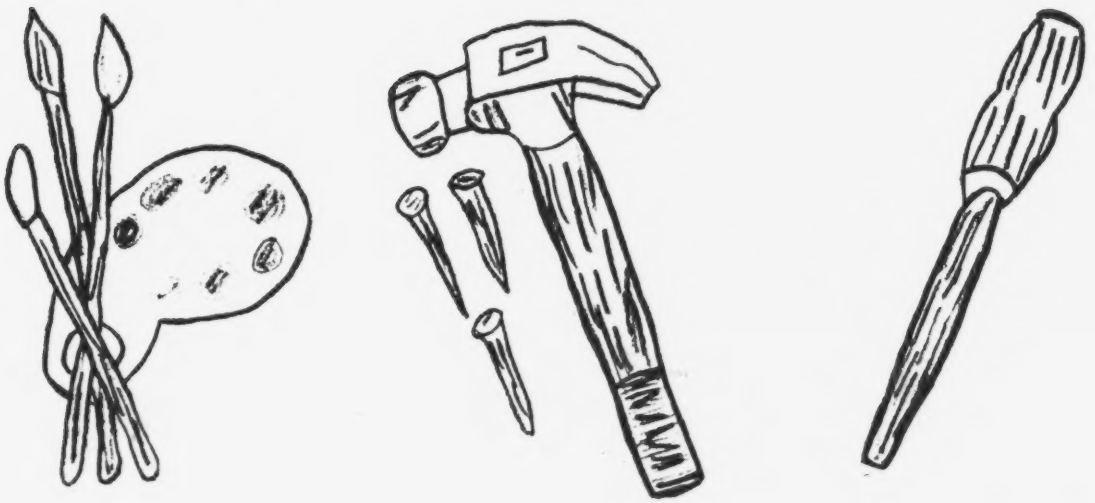
10. The pupil should complete the task that is stated in the lesson plan. For example, if a given task is required at the end of a class period, the per cent of pupils that completed the task should be indicated.

11. The camera, film and flash cubes should be in good working condition. For example, the flash cubes should work.

12. The pupils should use the camera in the proper manner. Camera movement spoils more pictures than anything else. The pupils should have a good grip on their camera and gently squeeze the shutter release.

APPENDIX C

THE GREAT WORLD OF WORK
CURRICULUM GUIDE



My name is_____

INDUSTRIAL ARTS DEPARTMENT
HARRISBURG MIDDLE SCHOOL
HARRISBURG, PENNSYLVANIA

APPENDIX C (continued)
Purpose of Each Session

I. ORIENTATION

Orients pupil to aims of the program.

II. WHAT ARE JOB TEMPERAMENTS?

Explains the different types of occupational sections to which workers must adjust.

III. HOW JOBS ARE ORGANIZED

Explains the newly created 15 job clusters.

IV. WHAT ARE WORKING CONDITIONS?

Explains that people must work under a variety of working conditions.

V. MY VISIT TO THE WORLD OF MANUFACTURING

Emphasizes how products are made in the modern technology.

VI. WHAT ARE PHYSICAL CAPACITIES?

Explains that people must be engaged in certain physical capacities in order to perform their job.

VII. WHAT ARE APTITUDES?

Explains that people need certain aptitudes in order to perform their job functions.

VIII. MY VISIT TO THE WORLD OF CONSTRUCTION

Emphasizes modern construction techniques.

IX. MY VISIT TO THE WORLD OF SERVICE AND MAINTENANCE

Emphasizes how people help other people.

X. WHAT KIND OF PERSON AM I?

Encourages feeling of self-awareness

XI. HOW CAN I PREPARE FOR A JOB IN THE FUTURE?

Explains the various programs at the vo-tech school, college opportunities and other types of training.

XII. WHAT SHOULD I KNOW ABOUT PRESTIGE, SALARY AND SECURITY IN OCCUPATION?

Helps the pupil to evaluate his choice.

APPENDIX C (continued)

XIII. MY INTERVIEW WITH A WORKER

Gives the pupil a primary way of obtaining career information.

XIV. MY JOB INTERVIEW

Encourages pupils to tell the world what he wants to be.

XV. STUDENT EVALUATION

Helps the pupil to evaluate what he has learned.

APPENDIX C (continued)

Orientation

Exercise I

NAME _____ GRADE _____

1. Why do we study the Great World of Work?

2. The places we will visit.

3. The things we will do.

APPENDIX C (continued)

What Are Temperaments?

Excercise II

1. Fill in the blanks with the name of a worker you observed.

2. Answer Yes or No to the following temperaments about the worker you observed. Please (X).

Temperament		YES	NO	YES	NO	YES	NO
1.	Many different activities	( )	( )	( )	( )	( )	( )
2.	Doing the same activity	( )	( )	( )	( )	( )	( )
3.	Following instructions	( )	( )	( )	( )	( )	( )
4.	Plan, direct & control activity	( )	( )	( )	( )	( )	( )
5.	Working with people	( )	( )	( )	( )	( )	( )
6.	Working alone	( )	( )	( )	( )	( )	( )
7.	Dangerous work	( )	( )	( )	( )	( )	( )
8.	Decision making based upon touch, taste, sight, smell & hearing	( )	( )	( )	( )	( )	( )
9.	Influencing other people	( )	( )	( )	( )	( )	( )
10.	Grading information	( )	( )	( )	( )	( )	( )
11.	Understanding facts	( )	( )	( )	( )	( )	( )
12.	Working within standards or proper sizes	( )	( )	( )	( )	( )	( )

APPENDIX C (continued)

How Jobs Are Organized

Exercise III

Name one or two jobs that fit into one of the following job clusters.

BUSINESS & OFFICE	Secretary		
MARKETING & DISTRIBUTION	Salesman		
COMMUNICATIONS & MEDIA	Radio Announcer		
CONSTRUCTION	Carpenter		
MANUFACTURING	Warehouse Worker		
TRANSPORTATION	Seaman		
AGRI-BUSINESS & NATURAL RESOURCES	Farmer		
MARINE SCIENCE	Fisherman		
ENVIRONMENTAL CONTROL	Game Warden		
PUBLIC SERVICES	Lawyer		
HEALTH	Nurse		
HOSPITALITY	Tour Guide		
PERSONAL SERVICES	Hair Dresser		
FINE ARTS & HUMANITIES	Actor		
CONSUMER & HOMEMAKING	Interior Decorator		

APPENDIX C (continued)

What Are Working Conditions?

Exercise IV

1. Fill in the blanks with the name of a worker you observed.

2. Answer Yes or No to the following working conditions about a worker you observed. Please (X).

Working Conditions	_____ YES	NO	_____ YES	NO	_____ YES	NO
1. Inside Work	( )	( )	( )	( )	( )	( )
2. Outside Work	( )	( )	( )	( )	( )	( )
3. Both inside & outside	( )	( )	( )	( )	( )	( )
4. Extreme cold plus temperature change	( )	( )	( )	( )	( )	( )
5. Extreme heat plus temperature change	( )	( )	( )	( )	( )	( )
6. Noise & Vibration	( )	( )	( )	( )	( )	( )
7. Hazards	( )	( )	( )	( )	( )	( )

APPENDIX C (continued)

My Visit to the World of Manufacturing

Exercise V

1. Write a short paragraph about the World of Manufacturing.

2. Develop a picture story or write a short description of the various steps involved in making a product on the assembly line.

3. Take pictures or write a short description about the working conditions at the factory.

4. Take pictures or note the various jobs at the factory.

APPENDIX C (continued)

OBSERVATION FORM

NAME_____ GRADE_____

SCHOOL_____ DATE_____

NAME OF COMPANY_____

NAME OF OCCUPATION_____

		Please (x)		
		YES	NO	UNDECIDED
1.	Worker uses hands	( )	( )	( )
2.	Worker does many operations	( )	( )	( )
3.	Worker works with people	( )	( )	( )
4.	Worker works alone	( )	( )	( )
5.	Worker works with ideas	( )	( )	( )
6.	Worker works outside	( )	( )	( )
7.	Worker works inside & outside	( )	( )	( )
8.	Worker works with things	( )	( )	( )
9.	Is their work dangerous	( )	( )	( )
10.	Are tool or equipment essential in their work	( )	( )	( )
11.	Is their work noisy	( )	( )	( )
12.	Worker sits	( )	( )	( )
13.	Worker stands	( )	( )	( )
14.	Worker works fast	( )	( )	( )
15.	Worker gets dirty	( )	( )	( )
16.	Worker does light work	( )	( )	( )
17.	Worker does heavy work	( )	( )	( )
18.	Worker does variety of activities	( )	( )	( )
19.	Worker repeats same activity	( )	( )	( )
20.	Worker seems happy	( )	( )	( )

APPENDIX C (continued)

What Are Physical Capacities?

Exercise VI

1. Fill in the blanks with the name of a worker you observed.

2. Answer Yes or No to the following physical capacities about a worker you observed. Please (X).

Physical Capacity	_____ YES	NO	_____ YES	NO	_____ YES	NO
1. Light work	( )	( )	( )	( )	( )	( )
2. Medium work	( )	( )	( )	( )	( )	( )
3. Heavy work	( )	( )	( )	( )	( )	( )
4. Climbing-Balancing	( )	( )	( )	( )	( )	( )
5. Stooping & kneeling	( )	( )	( )	( )	( )	( )
6. Reaching-Handling	( )	( )	( )	( )	( )	( )
7. Seeing	( )	( )	( )	( )	( )	( )
8. Talking & hearing	( )	( )	( )	( )	( )	( )

APPENDIX C (continued)

What Are Aptitudes?

Exercise VII

Name two jobs that require the following aptitudes.

1.	High verbal aptitude	Newspaper Editor		
2.	High numerical aptitude	Math Teacher		
3.	High learning ability	Doctor		
4.	High spatial aptitude	Dentist		
5.	High form perception	Fingerprint Classifier		
6.	High clerical perception	Cashier		
7.	High eye-hand-foot coordination	Baseball Player		
8.	High motor coordination	Typist		
9.	High color discrimination	Artist		
10.	High manual dexterity	Auto Mechanic		

APPENDIX C (continued)

My Visit to the World of Construction

Exercise VIII

1. Write a short paragraph about the World of Construction.

2. Develop a picture story or write a short paragraph about construction techniques.

3. Take pictures or write a short description about the working conditions at the construction site.

4. Take pictures or note the various jobs at the construction site.

APPENDIX C (continued)

My Visit to the World of Service and Maintenance

Exercise IX

1. Write a short description about the World of Service and Maintenance.

2. Develop a picture story or write a short description about different services workers are performing.

3. Take pictures or write a short description about the working conditions at the service and maintenance garage.

4. Take pictures or note the various jobs at the garage.

APPENDIX C (continued)

What Kind of Person Am I?

Exercise X

See if you can match the following interests to one of the categories of interest. There is only one answer for each category.

1.	Go to parties	( ) A	Science
2.	Discover new things	( ) B	Art
3.	Use tools to make things	( ) C	Verbal
4.	Have a speaking part in a play	( ) D	Music
5.	Paint a picture	( ) E	Social
6.	Whistle while you work	( ) F	Manual
7.	Go swimming	( ) G	Social Studies
8.	Visit a prison	( ) H	Active

APPENDIX C (continued)

NAME_____ DATE_____ SECTION_____

PROFILE CHART

	Social	Science	Manual	Verbal	Art	Music	Social Studies	Active Play
+20								
+19								
+18								
+17								
+16								
+15								
+14								
+13								
+12								
+11								
+10								
+ 9								
+ 8								
+ 7								
+ 6								
+ 5								
+ 4								
+ 3								
+ 2								
+ 1								
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- 1								
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- 5								
- 6								
- 7								
- 8								
- 9								
-10								
-11								
-12								
-13								
-14								
-15								
-16								
-17								
-18								
-19								
-20								

APPENDIX C (continued)

How Can I Prepare for a Job in the Future?

Exercise XI

1. Read carefully each course offering in the Harrisburg Vo-Tech School Handbook.

2. Take pictures or write a short description about the shops that you observed.

3. List other ways of training for a job.

APPENDIX C (continued)

What Should I Know About Prestige, Salary, and Security in Occupations?

Exercise XII

1. What does the word Prestige mean?

2. What does the word Salary mean?

3. What does the word Security mean?

APPENDIX C (continued)

My Interview with a Worker

Exercise XIII

1. Take notes about other student reports that interests you.

APPENDIX C (continued)

INTERVIEW FORM

Name_____ Date_____

1. Name of person interviewed_____

   Job Title_____

   Place Employed_____

2. What are the activities and duties of your job?

_____

_____

_____

3. What are the educational and/or training requirements for your job?

( ) A. High school graduate
( ) B. College graduate
( ) C. Apprenticeship program
( ) D. Technical school
( ) E. On-the-job training
( ) F. None of these
( ) G. I don't know

4. How and why did you choose this job?

_____

_____

_____

5. What are the advantages and disadvantages of your job?

_____

_____

_____

6. How many hours per week do you work?_____

   How many weeks vacation do you receive?_____

   How many days sick leave do you receive?_____

APPENDIX C (continued)

My Job Interview

Exercise XIV

1. My name is _____
2. I am _____ years old
3. I am in _____ grade
4. I go to the _____ school
5. I live at _____
6. When I leave school I hope to be a _____
7. I want to do this because:

_____ Someone in my family does that kind of work

_____ My parents want me to do that kind of work

_____ My best friend is going to do that kind of work

_____ I am really interested in that kind of work

_____ I don't know why I selected that kind of work

APPENDIX C (continued)

STUDENT EVALUATION FORM

NAME _____ DATE _____

SCHOOL _____ GRADE _____

1. What part of the Great World of Work did you like best?

2. What part of the Great World of Work did you dislike?

3. Did you like or dislike doing the camera exercises?

4. Did you like or dislike the field trips?

5. Would you like to be in a similar program next year?

APPENDIX C (continued)

AN INCOMPLETE LIST OF COMMON OCCUPATIONS

accountant
actor
actress
architect
automobile body repairman
automobile mechanic
automobile salesman
baker
bank teller
barber
beauty operator
boilermaker
bookbinder
bookkeeper
brick layer
builder
bus driver
buyer
cabinetmaker
carpenter
cashier
chemist
clergyman
clerk
coach
coal miner
cook
counselor
dentist
designer
detective
diesel mechanic
ditch digger
diver
doctor
draftsman
dress maker
druggist
electrical repairman
engineer
farmer
FBI agent
fireman
florist
forest ranger
gardener
gas station attendent
geologist
guard
hairdresser
housekeeper
industrial engineer
inspector
janitor
jeweler
journalist
junior executive
judge
laboratory technician
lawyer
librarian
lineman
life insurance agent
lumberjack
machinist
maid
mailman
manager
material handler
meat cutter
medical assistant
messenger
minister
model
musician
navigator
newspaper reporter
nurseryman
office machine operator
optometrist
painter
paper hanger
personnel manager
photographer
pilot
plasterer
plumber
policeman
postal employee
practical nurse
preacher
principal
printer
radio & TV announcer
railroad conductor
real estate salesman
receptionist
refrigeration mechanic
registered nurse
repairman
routeman
sailor
sales clerk
salesman
scientist
secretary
semi-skilled machine operator
sheet metal worker
shoe repairman
sign writer
social worker
stenographer
stewardess
stock clerk
stone mason
street cleaner
surveyor
tailor
taxi driver
teacher
technician
telephone operator
tool & die maker
trash collector
travel agent
truck driver
TV repairman
typist
undertaker
veterinarian
watchmaker
watchman
waitress
waiter
weatherman
welder
woodworker occupations
writer
X-ray technician
zoo keeper
zoologist

APPENDIX D

TABLE 19

Means and Standard Deviations for Treatment 1
On the VDI, POQ and PII

	Pre-Test		Posttest	
Dependent Variable	Mean	Standard Deviation	Mean	Standard Deviation
VDI	74.62	4.89	78.46	4.51
POQ	11.22	4.95	15.26	5.06
PII-1	17.46	6.29	17.74	6.09
PII-2	21.82	8.08	21.38	6.99
PII-3	24.32	7.04	25.16	6.73
PII-4	25.26	8.23	25.48	6.99
PII-5	22.32	7.26	23.14	6.55
PII-6	18.60	6.91	20.00	6.54
PII-7	9.52	3.67	9.22	3.03
PII-8	10.08	3.77	10.66	3.50
PII-9	7.26	2.41	8.20	2.10

TABLE 20

Means and Standard Deviations for Treatment 2
On the VDI, POQ and PII

	Pre-Test		Posttest	
Dependent Variable	Mean	Standard Deviation	Mean	Standard Deviation
VDI	75.86	5.29	79.11	4.76
POQ	13.30	4.69	16.40	4.36
PII-1	17.88	6.14	18.96	6.03
PII-2	21.90	12.39	21.75	9.43
PII-3	24.11	6.24	24.50	6.50
PII-4	26.21	9.56	26.40	8.50
PII-5	21.38	6.22	21.78	5.74
PII-6	19.63	6.50	18.57	5.37
PII-7	9.28	3.70	10.48	3.77
PII-8	11.03	4.02	11.26	3.54
PII-9	6.86	2.58	7.61	2.41

TABLE 21

Means and Standard Deviations for Treatment 3
On the VDI, POQ and PII

	Pre-Test		Posttest	
Dependent Variable	Mean	Standard Deviation	Mean	Standard Deviation
VDI	74.30	5.90	75.71	5.75
POQ	12.01	4.61	13.46	4.02
PII-1	17.39	5.62	18.75	5.53
PII-2	25.21	9.58	25.76	9.39
PII-3	23.78	6.38	22.85	5.67
PII-4	24.62	9.08	25.26	8.18
PII-5	21.48	6.52	22.28	6.58
PII-6	19.80	5.97	18.71	5.85
PII-7	8.96	3.72	10.19	4.07
PII-8	10.19	4.35	10.78	4.07
PII-9	7.25	2.60	7.42	2.17

APPENDIX E

TABLE 22

Analysis of Variance Summary for the PII
Scale 1 (Interpersonal Service)

Source	Mean Squares	df	F-Ratio
Between Subjects			
Treatment (A)	17.3656	2	0.303
Reading (B)	1.5316	1	0.027
A x B	69.3023	2	1.210
Error	57.2610	152	
Within Subjects			
Testing (J)	67.4557	1	5.200*
A x J	8.11479	2	0.625
B x J	6.12658	1	0.472
A x B x J	72.6169	2	5.597*
Error	12.9734	152	

*Significant at the .05 level

TABLE 23

Analysis of Variance Summary for the PII
Scale 2 (Natural)

Source	Mean Squares	df	F-Ratio
Between Subjects			
Treatment (A)	516.605	2	3.606*
Reading (B)	643.674	1	4.493*
A x B	31.6524	2	0.221
Error	143.253	152	
Within Subjects			
Testing (J)	0.31645	1	0.000
A x J	7.01629	2	0.202
B x J	29.7753	1	0.857
A x B x J	48.3676	2	1.393
Error	34.7300	152	

*Significant at the .05 level

APPENDIX E (continued)

TABLE 24

Analysis of Variance Summary for the PII
Scale 3 (Mechanical)

Source	Mean Squares	df	F-Ratio
Between Subjects			
Treatment (A)	56.6647	2	0.883
Reading (B)	0.126582	1	0.006
A x B	258.351	2	4.026*
Error	64.1718	152	
Within Subjects			
Testing (J)	0.316456	1	0.019
A x J	22.6563	2	1.369
B x J	2.13924	1	0.129
A x B x J	15.5276	2	0.939
Error	16.5538	152	

*Significant at the .05 level

TABLE 25

Analysis of Variance Summary for the PII
Scale 4 (Business)

Source	Mean Squares	df	F-Ratio
Between Subjects			
Treatment (A)	51.8006	2	0.425
Reading (B)	385.446	1	3.160
A x B	29.2099	2	0.239
Error	121.985	152	
Within Subjects			
Testing (J)	10.2816	1	0.496
A x J	1.73066	2	0.083
B x J	0.28481	1	0.001
A x B x J	77.0680	2	3.717*
Error	20.7342	152	

*Significant at the .05 level

APPENDIX E (continued)

TABLE 26

Analysis of Variance Summary for the PII
Scale 5 (Esthetic)

Source	Mean Squares	df	F-Ratio
Between Subjects			
Treatment (A)	35.8316	2	0.538
Reading (B)	8.23101	1	0.123
A x B	178.180	2	2.673
Error	66.6601	152	
Within Subjects			
Testing (J)	36.2310	1	2.209
A x J	1.44986	2	0.088
B x J	34.8892	1	2.127
A x B x J	24.0800	2	1.468
Error	16.4034	152	

TABLE 27

Analysis of Variance Summary for the PII
Scale 6 (Scientific)

Source	Mean Squares	df	F-Ratio
Between Subjects			
Treatment (A)	1.08303	2	0.018
Reading (B)	29.1646	1	0.488
A x B	33.7339	2	0.564
Error	59.8138	152	
Within Subjects			
Testing (J)	6.69620	1	0.381
A x J	52.3068	2	2.977
B x J	31.6456	1	1.801
A x B x J	17.1022	2	0.973
Error	17.5713	152	

APPENDIX E (continued)

TABLE 28

Analysis of Variance Summary for the PII
Scale 7 (Verbal)

Source	Mean Squares	df	F-Ratio
Between Subjects			
Treatment (A)	6.84828	2	0.348
Reading (B)	30.3924	1	1.543
A x B	10.6302	2	0.540
Error	19.6944	152	
Within Subjects			
Testing (J)	42.5823	1	5.718*
A x J	19.5691	2	2.628
B x J	0.810127	1	0.109
A x B x J	18.7175	2	2.513
Error	7.44760	152	

*Significant at the .05 level

TABLE 29

Analysis of Variance Summary for the PII
Scale 8 (Computational)

Source	Mean Squares	df	F-Ratio
Between Subjects			
Treatment (A)	18.4663	2	0.769
Reading (B)	91.4557	1	3.808*
A x B	5.59799	2	0.233
Error	24.0144	152	
Within Subjects			
Testing (J)	17.3291	1	2.760
A x J	1.09436	2	0.174
B x J	0.810127	1	0.129
A x B x J	7.74363	2	1.234
Error	6.27753	152	

*Significant at the .05 level

APPENDIX E (continued)

TABLE 30

Analysis of Variance Summary for the PII
Scale 9 (Time Perspective)

Source	Mean Squares	df	F-Ratio
Between Subjects			
Treatment (A)	6.83041	2	0.891
Reading (B)	3.65823	1	0.477
A x B	9.18251	2	1.197
Error	7.66963	152	
Within Subjects			
Testing (J)	29.1646	1	7.962*
A x J	4.22165	2	1.153
B x J	6.69620	1	1.828
A x B x J	11.4589	2	3.128*
Error	3.66301	152	

*Significant at the .05 level